

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated June 1, 2007, has been received and its contents carefully reviewed.

Claims 1-3, 5-12, 14-32, and 34-47 are rejected by the Examiner. With this response, claims 1, 3, 9-12, 14-17, 24, 30, 35, and 42-44 have been amended, and claims 2, 6 and 31 are hereby canceled without prejudice or disclaimer. No new matter has been added. Claims 1, 3, 5, 7-12, 14-30, 32, and 34-47 remain pending in this application.

In the Office Action, claims 1, 2, 5-8, 30, 31, and 34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2002/0030653 to Cairns et al. (hereinafter “Cairns1”) in view of U.S. Patent No. 6,268,841 to Cairns et al. (hereinafter “Cairns2”) and further in view of U.S. Patent No. 5,892,493 to Enami et al (hereinafter “Enami”). Claims 3 and 32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cairns1 and Cairns2 in view of Nitta. Claims 9-12, 14-29, 35-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cairns1 in view of Cairns2, Enami, and Nitta.

The rejection of claims 1, 2, 5-8, 30, and 34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cairns1 and Cairns2, in view of Enami are respectfully traversed and reconsideration is requested.

Independent claim 1 recites a data driving apparatus for a liquid crystal display device having a combination of features including, for example, “a second multiplexer part providing the corresponding data lines with the pixel signals from the output buffer part for the enable period of a source output enable signal and a reference voltage of liquid crystal cells for the disabled period of the source output enable signal.” Applicants submit that Cairns1, Cairns2, and Enami, analyzed singly or in any combination do not teach or suggest at least this combination of features recited in claim 1.

In the rejection of claim 6 in the Office Action, the Examiner cites Fig. 11b of Cairns2 as teaching “providing the corresponding data lines with the pixel signals from the output buffer part for the enable period of a source output enable signal and a reference voltage of liquid crystal cells for the disabled period of the source output enable signal.” Applicants respectfully disagree with the Examiner’s conclusion regarding Cairns2. Applicants submit, for example, that there is no teaching in Cairns2 or Cairns1 to provide “the corresponding data lines with ... a

reference voltage of liquid crystal cells for the disabled period of the source output enable signal,” as recited in claim 1.

The Office Action relies on Enami to cure deficiencies in the teachings of Cairns1 and Cairns2. Applicants submit that Enami does not cure the deficiencies in the teachings of Cairns1 and Cairns2 described above. For example, the multiplexer 38 of Enami cited by the Examiner “applies the data voltage output from the data line driver 40 to respective data lines of the corresponding data line group.” Accordingly, Applicants submit that Cairns1, Cairns2, and Enami, analyzed singly or in any combination do not teach or suggest the combined features of claim 1, and claims 5-8 depending from claim 1 for at least the reasons given above.

Independent claim 30 recites a data driving method for a liquid crystal display device having a combination of features including, for example, “providing the corresponding data lines with the held pixel signals for an enable period of an input source output enable signal and a reference voltage of liquid crystal cells for a disable period of the input source output enable signal.” Applicants submit that Cairns1, Cairns2, and Enami, analyzed singly or in any combination do not teach or suggest at least this combination of features recited in claim 30, and that claim 30, and claim 34 depending from claim 30 are each allowable over Cairns1, Cairns2, and Enami for at least the reasons given above for claim 1.

The rejection of claims 3 and 32 under 35 U.S.C. § 103(a) as being unpatentable over Cairns1 and Cairns2, in view of Nitta is respectfully traversed and reconsideration is requested.

As an initial matter, Applicants note that claims 3 and 32 each depend respectively from claims 1 and 30, and that each includes by reference all of the features of its respective base claim.

As discussed above, Cairns1, Cairns2, and Enami do not teach or suggest at least “providing the corresponding data lines with the held pixel signals for an enable period of an input source output enable signal and a reference voltage of liquid crystal cells for a disable period of the input source output enable signal” as recited in claims 1 and 30. The Examiner cites Nitta as teaching “a positive digital-analog converter converting the digital pixel data to a positive pixel signal; a negative digital-analog converter converting the digital pixel data to a negative pixel signal in accordance with a polarity control signal.” Applicants do not reach the Examiner’s conclusion regarding the teachings of Nitta. Applicants submit that Nitta does not cure the deficiencies in the teachings of Cairns1, Cairns2, and Enami with respect to the

combined features recited in claims 1 and 30 as discussed above. Accordingly, Applicants submit that the Examiner has failed to establish a prima facie case of obviousness of claim 1 and 30, and claims 3 and 32 depending respectively from claims 1 and 30 over Cairns1, Cairns2, Enami and Nitta.

The rejection of claims 9-12, 14-29, 35-47 under 35 U.S.C. 103(a) as being unpatentable over Cairns1 in view of Cairns2, Enami, and Nitta is respectfully traversed and reconsideration is required.

Claim 9 recites a data driving apparatus for a liquid crystal display device having a combination of features including “a multiplexer part performing a time-division on inputted digital pixel data on a first horizontal period and providing the time-divided pixel data through positive and negative polarity output channels; a digital-analog converter part converting the time-divided digital pixel data received from each of the multiplexer output channels into time-divided analog pixel signals having a polarity corresponding to the polarity of the respective multiplexer output channel; a demultiplexer part providing the time-divided pixel signal received from the digital-analog converter to output channels of the demultiplexer corresponding to data lines” Applicants submit that Cairns1, Cairns2, Enami, and Nitta, analyzed singly or in any combination, do not each at least the above-identified combination of elements recited in claim 9. Accordingly, Applicants submit that claim 9, and claims 10-12 and 14-29, are each allowable over Cairns1, Cairns2, Enami, and Nitta for at least this reason.

Claims 35-47 each recites a data driving method for a liquid crystal display device having a combination of features including “performing a time-division on a digital pixel data and providing the time-divided digital pixel data through positive and negative output channels; converting the time-divided digital pixel data from the positive and negative output channels into analog pixel signals having a polarity corresponding to each of the output channels; demultiplexing the time-divided positive and negative analog pixel signals to a plurality of paths corresponding to data lines.” Applicants submit that the cited references including Cairns1, Cairns2, Enami, and Nitta, analyzed singly or in combination do not teach at least this combination of features recited in claim 35. Accordingly, Applicants respectfully submit that claims 35-47 are each allowable over Cairns1, Cairns2, Enami, and Nitta for at least this reason.


Applicants believe application is in condition for allowance in light of the foregoing amendments and remarks and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. § 1.136, and any additional fees required under 37 C.F.R. § 1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. *A duplicate copy of this sheet is enclosed.*

Respectfully submitted,

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